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CASE REPORT

Challenging Surgery of a Large Chest Wall Chondrosarcoma - A Case Report

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ABSTRACT
The chondrosarcoma of a rib is a sporadic malignant tumor of the bone. The main sign is an enlarging painful anterior chest wall tumor. We present a case of 32-years old female with a thoracoabdominal tumor size of 20 cm × 16cm involving the left 9th rib. Since chondrosarcoma is less sensitive to chemotherapy and radiotherapy, surgical treatment with extensive resection is considered first-line treatment. Sufficient soft-tissue reconstruction of the thoracic wall after extensive resection represents a formidable challenge. This article aims to illustrate the possibility of resectioning the six last ribs with no complicated reconstruction technique.
KEYWORDS: Chest wall- Chondrosarcoma- Reconstruction- Rib- Diaphragm.

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INTRODUCTION
Chondrosarcomas are the most common malignant tumors of the chest wall [1]. Chondrosarcomas habitually involve the pelvis and extremities of the long bones. In rare cases, the chest wall can be affected. Cartilage tumors are often heterogeneous and difficult to diagnose on histology alone. Diagnosis requires clinicopathologic and radiologic findings [2]. Usually, chondrosarcomas are refractory to radiation and chemotherapy [3]; therefore, vast en bloc surgical excision remains the best chance for cure. Different challenging reconstruction techniques are available; the choice depends on the size and location of the tumor. Sometimes the best one is the simplest.

CASE REPORT
A 32-year-old woman admitted to our clinic with a left basithoracic mass has been evolving for several years with the recent onset of pain. Past medical history was unremarkable. Physical examination showed an enormous thoracoabdominal solid mass fixed to the latest left ribs. The skin surface is normal. Thorax computed tomography (CT) demonstrated a heterogenous 20x16.5x16.5 cm round thoracoabdominal mass, centered on the ninth rib with lysis of the middle arches of the eighth, tenth, and eleventh left ribs. This process comes into contact with the kidney. It comes into close contact with the spleen and the left border of the liver without separation, with no sign of subcutaneous invasion radiologically (Figure 1a, 1b). Incisional biopsy revealed chondroma. There was no sign of distant organ or lymphatic metastasis.
The patient underwent en-bloc resection of the tumors, carrying ribs from the seventh to the eleventh, the large oblique muscle, the costal insertion of the diaphragm, and the parietal peritoneum. There is no invasion of neighboring structures (lung and abdominal organs) (Figure 2).

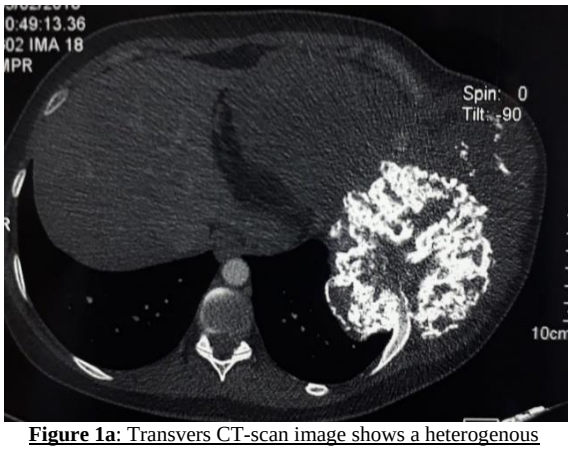

Figure 1a: Transvers CT-scan image shows a heterogenous tumor of the rib in contact with lung and abdominal organs.

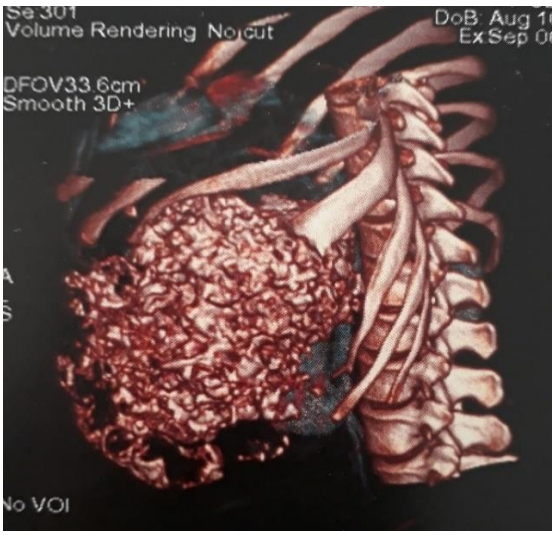

Figure 1 b: CT Scan with 3d Reconstruction of chest wall, witch precise the 9th rib as a first location of the tumor.

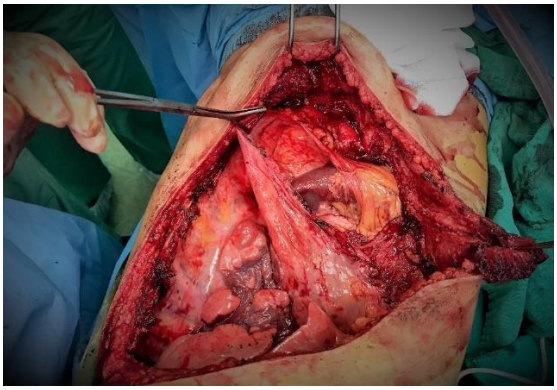

Figure 2: preoperative view showing resected ribs, the communication between pleural and peritoneal cavities through the diaphragmatic defect.

Reconstruction of the reinsertion of the diaphragm was a real challenge. Its reinsertion on the sixth rib was impossible and could reverse the dome. We opted for its reinsertion on the abdomen muscles, allowing at the same time to covert the peritoneal cavity, a Polymesh Dual mesh provided for this purpose is abolished. The costal defect is covered by a PTFE mesh, the adjacent muscles, and the subcutaneous tissue. The postoperative course was marked by oedema of the lower limbs to hypoproteinemia corrected by a hyperprotidic diet and a limited paradoxical motion of the chest wall. The patient was discharged on postoperative day 14. The final histopathological exam concludes to chondrosarcoma grade I with free margin. Adjuvant chemo or radiotherapy was not necessary.

Six months later, the patient developed a parietal infection managed by vacuum and antibiotics.

The result after four years of follow-up is good without recurrence or daily life activities limitations.

DISCUSSION

Chondrosarcoma is the most common primary bone tumor involving the ribs and sternum [1]. It represents 8% of all chest wall tumors [4]. It mainly occurs after the 6th decade of life and has a discreet male predominance [5]. In the present case, the patient was a 32-year-old female. Chondrosarcoma is a heterogeneous entity, usually presented with a gradually growing solid and fixed mass. Concomitant chest pain is a sign of a bad prognosis [6]. Chondrosarcoma grade 3, with high metastatic potential, represents only 5-10% [7].

The tissue diagnosis is rarely obtained before surgery by incisional or needle biopsies, and excisional biopsies are preferred [3, 4]

Management strategies depend essentially on the possibility of an extensive resection with a sufficient margin considered first-line therapy. However, for the low grade in histology and the absence of aggressive imaging features, a local procedure like curettage can be proposed in specific cases [7].

Regarding therapeutic options, most chondrosarcoma is not responsive to chemotherapy and radiation [3], except for mesenchymal chondrosarcoma, with a few cases reporting adequate response [8].

Since chest wall reconstruction procedures are developed, wider chest wall resection becomes possible [9]. In this case, the total resection of the costal margin and the six lower ribs didn't offer support of equipment for ribs reconstruction. A successful anatomic result is obtained by diaphragmatic reinsertion and soft tissue sutures reinforced by simple PTFE mesh.

Ulrich et al. [10] reveal that the quality of margins (4 cm on each side) was a significant influencing factor for local recurrence but not overall survival. The important prognostic factors are patients with stage 3 tumors and local recurrence.

CONCLUSION

Costal chondrosarcoma is a rare tumor that is most common in this localization and poses diagnostic and surgical challenges. The low costal localization allows a wide resection without the need for ribs reconstruction contrary to the anterior and superior chest region, with satisfactory anatomic and clinical results.

AUTHORS' CONTRIBUTIONS

The participation of each author corresponds to the criteria of authorship and contributorship emphasized in the Recommendations for the Conduct, Reporting, Editing, and Publication of Scholarly work in Medical Journals of the International Committee of Medical Journal Editors. Indeed, all the authors have actively participated in the redaction, the revision of the manuscript, and provided approval for this final revised version.

PATIENT CONSENT

Written informed consent was obtained from the patient for the publication of this case report.

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